STAFF REPORT

LOCALIZED HEALTH IMPACTS REPORT

For Selected Projects Awarded Funding Through the Alternative and Renewable Fuel and Vehicle Technology Program Under Solicitation PON-13-607 – Hydrogen Refueling Infrastructure

CALIFORNIA
ENERGY COMMISSION

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DISCLAIMER

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PREFACE

The increased use of alternative and renewable fuels supports California's commitment to curb greenhouse gas (GHG) emissions, reduce petroleum use, improve air quality, and stimulate the sustainable production and use of alternative fuels within California. Alternative and renewable transportation fuels include electricity, natural gas, biomethane, hydrogen, ethanol, renewable diesel, and biodiesel. State investment is needed to fill the gap and fund the differential cost of these emerging fuels and vehicle technologies. This *Localized Health Impacts (LHI) Report* addresses infrastructure projects that provide hydrogen used in fuel cell electric vehicles (FCEVs).

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). This statute, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008), authorizes the California Energy Commission to "develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies." Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the ARFVTP through January 1, 2024.

The statute also directs the California Air Resources Board (ARB) to develop guidelines to ensure air quality improvements. The ARB Air Quality Improvement Program (AQIP) Guidelines, approved in 2008, are published in the *California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1, AB 118 Air Quality Guidelines for the Alternative and Renewable Fuel and Vehicle Technology Program and the AQIP*. The *AQIP Guidelines* require the Energy Commission, as the funding agency, to analyze the localized health impacts of ARFVTP-funded projects that require a permit (13 CCR § 2343).

ABSTRACT

California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1, § 2343(c)(6), requires the California Energy Commission to consider the localized health impacts when selecting projects for funding. For each funding cycle, the Energy Commission is required to analyze localized health impacts for projects proposed for program funding that require a permit.

This *Localized Health Impacts Report* reviews the project proposals under consideration for funding under PON-13-607, Hydrogen Refueling Infrastructure by the Alternative and Renewable Fuel and Vehicle Technology Program. This *Localized Health Impacts Report* contains the projects and site descriptions, and potential impacts contained in the proposals.

This *Localized Health Impacts Report* analyzes the combined impacts in the communities, including exposure to air contaminants or localized air contaminants, or both, and including, but not limited to, communities of minority populations or low-income populations, as declared by the project proposers or as determined by Energy Commission staff. This report identifies outreach to community groups and other affected stakeholders contained in the proposals.

Keywords: Air pollution, air quality, Air Quality Improvement Program (AQIP), California Air Resources Board (ARB), alternative fuel, Assembly Bill (AB) 118, California Environmental Quality Act (CEQA), criteria emissions, demographics, environmental justice (EJ) indicators, Environmental Justice Screening Method (EJSM), fuel cell electric vehicle (FCEV), greenhouse gas emissions (GHG), hydrogen

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EXECUTIVE SUMMARY

Under the *California Code of Regulations Title 13, (CCR § 2343),* this *Localized Health Impacts Report* describes the alternative fuel infrastructure projects proposed for Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) funding that may or may not require a conditioned or discretionary permit or environmental review, such as conditional use permits, air quality permits, wastewater permits, hazardous waste disposal permits, and other land-use entitlements. This report does not include projects requiring only residential building permits, mechanical/electrical permits, or fire/workplace safety permits, as these are determined to have no likely impact on the environment.

The California Energy Commission is required to assess the localized health impacts of the projects proposed for ARFVTP funding under the Hydrogen Refueling Infrastructure solicitation Public Opportunity Notice (PON) 13-607. This *Localized Health Impacts Report* focuses on the potential impacts the projects may or may not have on a particular community, particularly those communities that are considered especially vulnerable to emissions increases within their community. For projects located in high-risk communities, this report assesses the impacts from criteria emissions/air toxics, the air quality attainment status, and mitigation plans, if available. This *Localized Health Impacts Report* includes information about the proposer's outreach efforts, including public notices and community outreach.

Environmental justice communities, low-income communities, and minority communities are considered to be the most impacted by any project that could result in increased criteria and toxic air pollutants within an area because these communities typically have the most significant exposure to the emissions. Assessing these projects and the communities surrounding them is important because of the health risks associated with these pollutants. Preventing health issues from air pollution in any community is important, but it is especially important to minimize any negative impacts in communities that are already considered to be at risk due to their continued exposure to these contaminants.

The projects assessed in this report are those proposed for funding under PON-13-607. They are proposed to be located at 28 sites. Moreover, one mobile refueler is addressed. During normal operations, none of these facilities generate criteria emissions, particulate matter (PM), or air toxics at an appreciable level. The projects in this *Localized Health Impacts Report* are assessed for potential health impacts for the communities in which they could be located. Based on this analysis, it is not anticipated that implementation of the projects will have negative impacts on surrounding communities because there will not be a net increase in criteria and toxic emissions, specifically those communities that are considered most vulnerable. Potentially, the project stands to provide improved quality of life through cleaner air.

CHAPTER 1:
Projects Proposed for Funding

This chapter summarizes the projects proposed for Energy Commission funding. The projects in this *LHI Report* are:

Mobile Refueler

- Gas Technology Institute (GTI), GTI Mobile Hydrogen Fueler

Stations

- Air Liquide US LP, Air Liquide Northern California Hydrogen Fueling
- First Element Fuel, Inc., Hydrogen Refueling Stations in Northern California, Hydrogen Refueling Stations in Southern California, and a connector station
- Hydrogen Technology & Energy Corporation (HTEC), Four Corners Hydrogen Energy Center
- HyGen Industries, LLC, 100% Renewable & Sustainable Carbon-Free Hydrogen Fueling Station Network
- ITM Power, Inc., City of Riverside Hydrogen Filling Station
- Linde, LLC, Bishop Ranch Hydrogen Fueling Station and Oakland Airport Hydrogen Fueling Station
- Ontario CNG Station Inc., Ontario Stratos Fuel Hydrogen Station

Gas Technology Institute (GTI)

Project Name: GTI Mobile Hydrogen Refueler

This project is a mobile hydrogen refueler that will travel between the various hydrogen refueling stations in California as a back-up source of hydrogen fuel as-needed. The refueler will travel to hydrogen refueling stations that require back-up supplies of hydrogen while the stations undergo maintenance or are not functioning due to technical reasons.
The refueler will be configured on-board a Ford F-550 truck chassis and will travel about 5,000-10,000 miles annually. The number of miles depends on demand. The mobile refueler will pick up, transport, and dispense 100 percent renewable hydrogen. It is proposed to be configured with an on-board fuel cell that will draw from on-board hydrogen supplies to power the compressor and dispenser during refueling.

Outreach Efforts

The GTI Project Team will train operators for safety and operating protocols. Team members will also identify local authorities having jurisdiction (AHJs) and first responders. The project team will provide training webinars and on-site meetings for AHJs and local officials. They will work with Rio Hondo College in Whittier to include the mobile refueler as part of the curriculum for first responder training in the Los Angeles Basin. Material from this program can be used for training in other jurisdictions.

Air Liquide Industrial US

Project Name: Air Liquide Northern California Hydrogen Fueling

The station is proposed to be located at 2200 El Camino Real, Palo Alto, CA 94306, at an existing gasoline station at the corner of College Avenue and El Camino Real. Businesses, restaurants, and shopping centers are nearby. The station is proposed to dispense delivered hydrogen. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile of the project.

Outreach

Air Liquide will host town hall-style meetings with local interested parties such as environmental groups, business groups, and community groups. It will provide hands-on training with first responders (fire, first-aid, emergency management), including site tours and coordinated drills in Palo Alto and surrounding communities.

First Element Fuel, Inc.

Project Name: Hydrogen Refueling Stations in Northern California

This proposed project will involve eight locations. It will include the installation of one hydrogen storage tank and compression and dispensing equipment at each location. Delivery and storage will be in high-pressure composite trailers. The proposed outreach activities for the various stations follow the station descriptions below. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile of each of the proposed projects.

Campbell

2855 Winchester Boulevard, Campbell, CA 95008

The proposed project site is an existing gasoline station in an area that includes a railroad line, industrial buildings, offices, and homes. A convenience store is on the property to the west along Sunny Oaks Avenue. A small office complex is on the property adjacent to the south along Winchester Boulevard. A rail line runs parallel to Winchester Boulevard across from the subject property. A storage facility is on the northwest corner of the intersection.

Hayward

391 West A Street, Hayward, CA 94541
The proposed project site is an existing gasoline station. The property is on a corner, with driveway access from both West A Street and Arbor Avenue. A restaurant adjoins the property to the east along West A Street. A four-story multifamily housing complex is adjacent to the property on the northern property line. A hotel is across West A Street to the south. Interstate 880 is opposite the property to the west on the other side of Arbor Avenue.

Mill Valley

570 Redwood Highway, Mill Valley, CA 94941
The proposed project site is an existing gasoline station. Redwood Highway is a frontage road for U.S. Highway 101. A parking lot is on the southeast corner of the intersection of Redwood Highway Frontage Road. The northbound lanes of U.S. Highway 101 run parallel to Redwood Highway on its western edge.

Redwood City

690 Veterans Boulevard, Redwood City, CA 94063
The proposed project site is an existing gasoline station. The property is on the northwest corner of the intersection of Veterans Boulevard and Brewster Avenue. A two-story residential development and a commercial building are immediately adjacent to the property. A two-story retail building is on the northwest corner of the intersection of Brewster Avenue and Veterans Boulevard. A one-story insurance office is on the southeast corner, and the San Mateo County Government Center within a five-story building is on the southwest corner.

San Jose

2101 N 1st Street, San Jose, CA 95131
The proposed project site is an existing gasoline station. The property is in a highly urban area minutes from Mineta San Jose International Airport. A restaurant is on the adjacent parcel to the north along 1st street; a hotel is on the parcel to the west along Brokaw Road; and a five-story office building is on the northeast corner of the intersection. There is a vacant lot on the southeast corner of the intersection, and a two-story office building is on the southwest corner of the intersection. U.S. Highway 101 is roughly 100 yards to the west on the other side of the hotel.

Saratoga

12600 Saratoga Avenue, Saratoga, CA 95070
The proposed project site is an existing gasoline station in a residential area. A newer multifamily residential development adjoins the subject property to the south and east. Single-family homes exist across Bucknall Road to the north, across Saratoga Avenue to the west, and on the opposite northwest corner of the intersection. A preschool-K school is about 100 yards east of the site along Bucknall Road.

South San Francisco

248 South Airport Boulevard, South San Francisco, CA 94080
The proposed project site is an existing gasoline station in a highly urban area roughly one mile north of the San Francisco International airport and is very near the airport rental car center. Several hotels are nearby. One is north of the subject property along South Airport Boulevard. Another hotel is south of the property along South Airport Boulevard. A third is across the street on the west side of South Airport Boulevard. The northbound lanes of U.S. Highway 101 are immediately adjacent to the subject property along the western property line.

Truckee

12105 Donner Pass Road, Truckee, CA 96161
The proposed project site is an existing gasoline station in a rural forested setting, with a small amount of forest land across Donner Pass Road. A commercial strip mall is located immediately to the east along Donner Pass Road. Interstate 80 is to the south of the property, and Donner Pass Road wraps around both the west and north sides of the property.

Outreach Efforts for the Proposed Hydrogen Refueling Station in Northern California
See section following First Element Fuel Inc. Refueling Stations in Southern California.

First Element Fuel, Inc.

Project Name: Hydrogen Refueling Stations in Southern California (and One Connector)

This proposed project will involve 11 locations. It will include the installation of one hydrogen storage tank, and compression and dispensing equipment at each location. Delivery and storage will be in high-pressure composite trailers. Furthermore, First Element Fuel, Inc. proposes a hydrogen station to connect stations located in Northern and Southern California. The proposed outreach activities for the various stations follow the stations descriptions below. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile of the stations proposed in Southern California.

Coalinga

24505 West Dorris Avenue, Coalinga, CA 93210
The proposed project site is an existing gasoline station. This is a connector station. Active farm fields are south of the site. A restaurant/hotel facility is across Harris Ranch Drive to the east. Farmland exists to the north across West Dorris Avenue. A truck fueling station exists immediately to the west of the property between the property and Interstate 5. This hydrogen refueling station is planned as a connector station. The station is planned to connect stations located in Northern and Southern California.

Costa Mesa

2050 Harbor Boulevard, Costa Mesa, CA 92627
The proposed project site is an existing gasoline station at the corner of Harbor Boulevard and Bay Street. There is facility access on both streets, with a car dealership on both east and west sides of the property and a mechanic repair shop on the south end. There is a parking area at the southeast end of the property, which will be the location for the proposed hydrogen equipment.

La Cañada Flintridge

550 Foothill Boulevard, La Cañada Flintridge, CA 91011
The proposed project site is an existing gasoline station at the corner of Foothill Boulevard and Woodleigh Lane with access on both streets. The station has a church on the east side of Woodleigh, a commercial building on the west side, and a parking lot at its south end. There is adequate storage space at the southwest corner of property to locate the proposed hydrogen equipment and roughly 60 feet of hydrogen piping to the dispenser at the front end of the fueling island.

Laguna Niguel

30081 Crown Valley Parkway, Laguna Niguel, CA 92677
The proposed project site is an existing gasoline station at the corner of Crown Valley Parkway and Niguel Road. Two gas stations are at the north corner of the intersection. A restaurant is located at the east corner of the intersection. A church is located to the south. A business center is located to the west.

Lake Forest

20731 Lake Forest Drive, Lake Forest, CA 92630
The proposed project site is an existing gasoline station at the corner of Lake Forest Drive and Dimension Drive. The station is near shopping centers, restaurants, and auto repair shops.

Long Beach

3401 Long Beach Boulevard, Long Beach, CA 90807
The proposed project site is an existing gasoline station on the right-hand corner of Long Beach Boulevard and Wardlow Street and surrounded by mini-malls. On the west side, there is a convenience store parking area adequate for locating the proposed hydrogen equipment with a single nozzle dispenser located at the nearest fueling bay. There is street access on Long Beach Boulevard and Wardlow Street. The facility also has a convenience market and car wash.

Los Angeles (Culver City)

8123 Lincoln Boulevard, Los Angeles, CA 90045
The proposed project site is an existing gasoline station with apartment buildings on the west and south sides. Station access is on both West 83rd Street and Lincoln Boulevard. A large

storage area is at the southwest end of the property, and there is adequate space for the proposed hydrogen equipment. The facility has a convenience store and a mechanic repair shop.

Los Angeles (West Hollywood)

5700 Hollywood Boulevard, Los Angeles, CA 90028
The proposed project site is an existing gasoline station with apartment buildings on the east and south side of the property. The station has street access on North Wilton Place and Hollywood Boulevard. The proposed hydrogen equipment will be installed at the southwest corner of the property.

San Diego

3060 Carmel Valley Road, San Diego, CA 92130
The proposed project site is an existing gasoline station near the Interstate 5 freeway on-ramp at the corner of Carmel Valley Road and Old El Camino Real. A storage area on the southwest end of the property adjacent to a convenience store is adequate for the proposed hydrogen equipment. There are no structures close to this facility. There is a likely foot trail and vegetation on the east side of the property.

Santa Barbara

150 South La Cumbre Road, Santa Barbara, CA 93105
The proposed project site is an existing gasoline station near the intersection of Calle Real and South La Cumbre Road. To the east is a shopping center, to the west is a business center, and to the north is an animal hospital.

South Pasadena

1200 Fair Oaks Avenue, South Pasadena, CA 91030
The proposed project site is an existing gasoline station at the corner of Fair Oaks and Monterey Avenues with a house at the southwest end of the property. There is a large storage area at the southeast corner adequate for the proposed hydrogen equipment.

Outreach Efforts for the Proposed Hydrogen Refueling Station in Southern California (and One Connector Station)

First Element Fuel, Inc. plans to conduct outreach with state officials to educate local communities about the benefits of using hydrogen as a transportation fuel. First Element Fuel, Inc. will ask original equipment manufacturers (OEMs) and auto dealerships to participate in outreach. They will work with existing groups to target the outreach, for example, the League of California Cities. First Element Fuels, Inc. plans to work with the communities' K-12 students to disseminate information about the use of hydrogen as a transportation fuel.

HyGen Industries, LLC

Project Name: 100% Renewable & Sustainable Carbon-Free Hydrogen Fueling Station Network

This proposed project (three stations) will involve hydrogen generation, compression, and dispending equipment to be located at existing gas stations. Electrolysis will be used to produce hydrogen, and 100 percent renewable energy will be used for system power. The proposed outreach follows the station descriptions. Table 1 lists the quantity of schools, day care facilities, and health care facilities within one mile.

Rohnert Park

5060 Redwood Drive, Rohnert Park, CA 94928
The proposed project site is an existing gas station located next to an exit/entrance ramp to State Route 101, and at the intersection of Redwood Drive and Golf Course Drive. The station is proposed to be near a motel, stores, and restaurants.

Orange

8544 East Chapman Avenue, Orange, CA 92869
The proposed project site is an existing gas station in a commercially zoned area near State Route 241 and at the intersection of East Chapman Avenue and Jamboree Road. The station is proposed to be located near a grocery store and restaurants and is across the street from Santiago Canyon College.

Pacific Palisades

15281 West Sunset Boulevard, Pacific Palisades, CA 90272
The proposed site is an existing gas station in a commercially zoned area at the intersection of Swarthmore Avenue and West Sunset Boulevard. The station is proposed to be near stores, restaurants, and financial institutions.

Outreach

HyGen will work with local communities to maximize awareness of the new proposed hydrogen stations and the option to purchase FCEVs that can fuel at these stations. This outreach will include communication of the multifaceted benefits of true zero-emission vehicle implementation. The project specifies that stakeholders will manage all outreach with local officials (for example, fire marshals) and the local community to ensure transparency throughout the installation and to ensure excellent understanding of the equipment/system safety.

Hydrogen Technology & Energy Corporation (HTEC)

Project Name: Four Corners Hydrogen Energy Center

The proposed site is an existing gas station at 17287 Skyline Boulevard, Woodside, CA 94062. The station is proposed to be located at the "Four Corners" between State Highways 35 and 84. The station is about 6.5 miles from Interstate 280. The surrounding area is mainly residential with a convenience store, banquet facility, and restaurant within 0.3 miles. The Four Corners Hydrogen Energy Center is proposed to produces hydrogen onsite using an electrolyzer/compression system[1]. Furthermore, a portion of the hydrogen will be delivered to the station. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile of the project site.

Outreach

HTECH plans to increase public awareness about the use of hydrogen as a transportation fuel by developing an information kiosk next to the hydrogen refueling station, providing a ride-and-drive program at the station, and conducting site tours. It plans to apply social media to describe the site and to hold town hall meetings with environmental groups, business groups, and community groups. HTECH will conduct outreach and training with first responders (fire and emergency management).

ITM Power Inc.

Project Name: City of Riverside Hydrogen Filling Station

The proposed project site is located at 8095 Lincoln Avenue, Riverside, CA 92504 in the City of Riverside's Corporation Yard. It is located 0.8 mile from the on ramp to State Route 91. The proposed site is in the Presidential Park Neighborhood, surrounded by warehouses, offices, and rural residential areas more than 200 feet away.

The proposed project site is in the northeastern portion of the neighborhood that is primarily developed with the Riverside Auto Center, government operations facilities, an apartment complex, and manufacturing uses. The southwestern portion of the neighborhood is made up of mostly single-family home and institutional uses. Mixed within the conventional single-family residential tracts are several planned residential developments and existing apartments.

The public facilities located in the northeastern portion of the vicinity include the city's Utility Operations Center, the City Corporate Yard, and the city's Emergency Operations Center. Other public facilities within the neighborhood include a police station and the California Highway Patrol (CHP). The nearby 21-acre Don Derr Park includes sports fields, basketball

1 An electrolyzer is a device that converts water into hydrogen and oxygen using an electrical current.

courts, and covered picnic and barbeque facilities. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile.

Outreach

Working with the City of Riverside, ITM Power will provide outreach and education to the local community by posting information on the city's website and mailing flyers to neighborhood businesses and residents about this hydrogen refueling station. It also plans town meetings. Local schools will also be encouraged to visit the station.

Linde, LLC

Project Name: Oakland Airport Hydrogen Fueling Station

The proposed project site is located at 1019 Langley Street, Oakland, CA 94621, next to the Oakland Airport Rental Car Center. The site is presently undeveloped and zoned as the "Port of Oakland, North Airport." The equipment will consist of a basic hydrogen compression, dispensing, and storage system. Linde will periodically deliver liquid hydrogen to the site. At the site, the liquid hydrogen is vaporized and then compressed, cooled, and dispensed into vehicles. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile.

Outreach

See section following the proposed project: Bishop Ranch Hydrogen Fueling Station.

Project Name: Bishop Ranch Hydrogen Fueling Station

The proposed project site is located at 2451 Bishop Drive, San Ramon, CA 94583. The station is planned to be built on an OEM parts distribution center. Interstate 680 is adjacent to the proposed site, and the nearest interchange is three minutes away at Crow Canyon Road.

The California Department of Transportation (Caltrans) proposes to build a high-occupancy vehicle access ramp to Bishop Ranch at Norris Canyon Road or at one of the parallel streets to the south. The equipment will consist of a basic hydrogen compression, dispensing, and storage system. Linde will periodically deliver liquid hydrogen to the site. See Table 1 for quantity of schools, day care facilities, and health care facilities within one mile.

Outreach

Linde will work with the Center for Transportation and the Environment (CTE) of San Francisco on community outreach. Outreach activities will include town hall meetings, one-on-one meetings with nearby businesses, direct mail to property owners and homes within a ¼-mile radius, emails using Oakland and San Ramon city hall listservs and websites, information distributed through the fuel supplier's website, training sessions for first responders and operating personnel, and a user guide for consumers.

The Linde project team will provide site tours. The team will also distribute hydrogen outreach materials and Linde brochures about hydrogen used as a transportation fuel. The materials will be distributed in public libraries, city halls, and other public venues. Linde will coordinate with automotive OEMs to bring fuel cell cars to public meetings for demonstrations.

Ontario CNG Station Inc. – Stratos Fuel

Project Name: Ontario Stratos Fuel Hydrogen Station

The proposed site is an existing gas station at 1850 E Holt Boulevard, Ontario, CA 91761, that also provides compressed natural gas (CNG), diesel, and ethanol. A railroad line exists 200 yards south of the station. See Table 1 for the quantity of schools, day care facilities, and health care facilities within one mile.

Outreach Efforts

Stratos Fuel will organize outreach with the community. Town hall meetings will be organized, as well as visits to local businesses to discuss the benefits of using hydrogen as a transportation fuel, as well as safety precautions. Stratos Fuel will develop a website about the station. Newsletters will be sent to the Ontario city hall to describe the station.

Table 1: Facilities in the Surrounding Areas

Applicant/Project	Facilities Within 1 Mile of the Proposed Project Site
GTI: Mobile Hydrogen Refueling	Not applicable
Air Liquide Industrial US LP: Palo Alto, CA	10 schools, 10 day care facilities, 9 health care facilities
First Element Fuel, Inc.: Campbell, CA	14 schools, 12 day care facilities, 6 health care facilities
First Element Fuel, Inc.: Hayward, CA	7 schools, 7 day care facilities, 3 health care facilities
First Element Fuel, Inc.: Mill Valley, CA	7 schools, 3 day care facilities, 1 health care facility
First Element Fuel, Inc.: Redwood City, CA	11 schools, 11 day care facilities, 7 health care facilities
First Element Fuel, Inc.: San Jose, CA	6 schools, 3 day care facilities, 2 health care facilities

Applicant/Project	Facilities Within 1 Mile of the Proposed Project Site
First Element Fuel, Inc.: Saratoga, CA	9 schools, 3 day care facilities, and no health care facilities
First Element Fuel, Inc.: South San Francisco, CA	5 schools, 4 day care facilities, 1 health care facility
First Element Fuel, Inc.: Truckee, CA	5 schools, 4 day care facilities, and no health care facilities
First Element Fuel, Inc.: Coalinga, CA	0 schools, 0 day care facilities, and no health care facilities
First Element Fuel, Inc: Costa Mesa, CA	9 schools, 5 day care facilities, 3 health care facilities
First Element Fuel, Inc.: La Canada Flintridge, CA	12 schools, 6 day care facilities, 1 health care facility
First Element Fuel, Inc.: Laguna Niguel, CA	3 schools, 4 day care facilities, 2 health care facilities
First Element Fuel, Inc.: Lake Forest, CA	4 schools, 2 day care facilities, 2 health care facilities
First Element Fuel, Inc.: Long Beach, CA	10 schools, 12 day care facilities, 11 health care facilities
First Element Fuel, Inc.: Los Angeles, CA/Culver City	9 schools, 5 day care facilities, and no health care facilities
First Element Fuel, Inc.: Los Angeles, CA/West Hollywood	10 schools, 7 day care facilities, 4 health care facilities
First Element Fuel, Inc.: San Diego, CA	10 schools, 4 day care facilities, 4 health care facilities
First Element Fuel, Inc.: Santa Barbara, CA	9 schools, 4 day care facilities, 4 health care facilities
First Element Fuel, Inc.: South Pasadena, CA	13 schools, 7 day care facilities, 3 health care facilities
HTEC: Woodside, CA	0 schools, 0 day care facilities, and no health care facilities
HyGen Industries, LLC Orange, CA	5 schools, 4 day care facilities, and no health care facilities
HyGen Industries, LLC: Pacific Palisades, CA	6 schools, 4 day care facilities, 3 health care facilities
HyGen Industries, LLC: Rohnert Park, CA	5 schools, 3 day care facilities, 3 health care facilities
ITM Power Inc.: Riverside, CA	3 schools, 4 day care facilities, and no health care facilities
Linde LLC: Oakland, CA	1 school, 1 day care facility, 3 health care facilities
Linde LLC: San Ramon, CA	1 school, 4 day care facilities, 1 health care facilities

Applicant/Project	Facilities Within 1 Mile of the Proposed Project Site
Ontario CNG Station- Stratos Fuels Ontario, CA	5 schools, 1 day care facility, and no health care facilities

Source: California Energy Commission staff analysis

CHAPTER 2:
Approach and Results

Based on the Energy Commission's interpretation of the Air Quality Improvement Program (AQIP) Guidelines, this *LHI Report* assesses the potential impacts to communities as a result of the projects proposed for hydrogen refueling. This report is prepared under the *California Air Resources Board AQIP Guidelines, California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1 (CCR § 2343)*:

> "(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:
>
> > (A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.
> >
> > (B) Projects must be selected and approved for funding in a publicly noticed meeting."

This *LHI Report* is not intended to be a detailed environmental health or impact analysis of projects potentially to be funded by the program nor is this assessment intended to be a substitute for the comprehensive environmental review conducted by regulatory agencies during the California Environmental Quality Act (CEQA) process. The application of CEQA would provide a more detailed analysis of the potential for adverse environmental effects of the proposed projects.

Staff reviewed results from the Environmental Justice Screening Method (EJSM) to identify projects located in areas with social vulnerability indicators and the greatest exposure to air pollution and associated health risks.[2] The EJSM was developed to identify low-income communities highly affected by air pollution for assessing the impacts of climate change regulations, specifically Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006.

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2 California Air Resources Board (ARB). *Air Pollution and Environmental Justice, Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability Into Regulatory Decision-Making, 2010.* (Sacramento, California) Contract authors: Manuel Pastor Jr., Ph.D., Rachel Morello-Frosch, Ph.D., and James Sadd, Ph.D.

The EJSM identifies the various levels of risk in regions throughout California, and high-risk communities are considered vulnerable to even the smallest impacts. The EJSM integrates data on exposure to air pollution, cancer risk, ozone concentration and frequency of high ozone days, race/ethnicity, poverty level, home ownership, median household value, educational attainment, and sensitive populations (populations under 5 years of age, or over 65 years of age).

The Energy Commission identifies high-risk areas as those in nonattainment basins for ozone, particle pollution, or particulate matter (PM) 2.5 and PM 10, along with populations that have high poverty and minority rates as well as a high percentage of sensitive populations.

The projects assessed in this report include hydrogen refueling stations dispensing equipment at existing gas stations, an automotive parts facility, and an airport. The airport facility will be new construction (confirm). This report also assesses a mobile refueler. During normal operations, none of the facilities at existing gas stations will generate criteria emissions, particulate matter (PM), or air toxics at any appreciable level.[3] Hydrogen dispensing and refueling will not generate emissions beyond those generated already at the gas station. In some projects hydrogen will be delivered by truck, but this is not expected to expand truck traffic significantly.

Permits

For this *LHI Report*, the Energy Commission interprets "permits" to connote discretionary and conditional use permits because they require a review of potential impacts to a community and the environment before issuance.

For air permits, local air districts conduct a New Source Review (NSR) to determine the emission impacts. Since ministerial-level permits, such as building permits, do not assess public health-related pollutants, the Energy Commission staff does not assess projects requiring only ministerial level permits in this report.

Demographic Data

Staff collected information on ethnicity, age, and income for the city/community where the potential project, if funded, would be located. The information identifies those communities with higher minority populations, lower incomes, and highly sensitive groups based on age. For this assessment, staff identifies sensitive populations as individuals younger than 5 years of age and older than 65 years of age. The demographic data for the proposed project site are provided in Appendix B.

3 "Particulate matter (PM)" is unburned fuel particles that form smoke or soot and stick to lung tissue when inhaled.

Emissions

Staff considered emissions from the proposed projects. Truck delivery of hydrogen will be the only source of criteria pollutants; however, due to the infrequency of deliveries, the impacts will be marginal. Assessed criteria pollutants are volatile organic compounds (VOC), carbon monoxide (CO), oxides of nitrogen (NO_x), and particulate matter (PM10). Truck delivery emissions of criteria pollutants are considered and referenced in Appendix C.

The proposed projects are expected to have a net benefit by reducing emissions and leading to improved air quality. While overall air quality depends on several factors, staff expects that air quality will improve over time where the sites are proposed because there are no expected harmful emissions from the stations and there will be reduced emissions overall from driving FCEVs. A number of schools, day care facilities, and health care facilities are near the proposed projects. The results of these projects will be cleaner air for the people in these facilities.

Community Status of Proposed Projects

The following community status descriptions for the proposed projects are based on the California Air Resources Board *Proposed Screening Method,* which integrates data to identify low-income communities that are highly impacted by air pollution.[4] The *California Infrastructure State Implementation Plans* (http://www.arb.ca.gov/planning/sip/sip.htm) are used as a source for public notices for attainment plans. The *Green Book Nonattainment Areas for Criteria Pollutants* (http://www.epa.gov/oaqps001/greenbk) is also used as an information source for this assessment.

4 California Air Resources Board, *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution, 2010* (Sacramento, California).

CHAPTER 3:
Location Analysis and Community Impacts

Based on the staff's assessment of the proposed projects, it is expected that the surrounding communities would not be disproportionately impacted by the projects. For this *LHI Report*, environmental justice (EJ) indicators are evaluated as follows.

- A ***minority EJ*** is indicated if a minority subset represents more than 30 percent of a given city's population.

- A ***poverty level EJ*** is indicated if a city's poverty level exceeds California's poverty level of 15.3 percent).

- An ***unemployment EJ*** is indicated if a given city's unemployment rate exceeds California's unemployment rate of 7.8 percent as of April 2014).

- An EJ indicator is also noted for communities where the ***percentage of persons younger than 5 years of age or older than 65 years of age*** is 20 percent higher than the average of the percentage of persons under 5 years of age or over 65 years of age for the entire state. (For the entire state, the percentage of persons under the age of 5 years is 6.8 percent, and the percentage of persons over the age of 65 years is 11.4 percent.)

Staff identifies high-risk communities using the following factors: (1) those located in nonattainment air basins for ozone, PM 10 and PM 2.5; (2) those with high poverty, minority population, and/or unemployment rates; and (3) those with a high percentage of sensitive populations (people under 5 years of age and over 65 years of age). Those designated as high-risk communities would be located in nonattainment air basins and have one or more of the other two factors.

Of the 28 proposed project sites, 11 have minority indicators; 7 have poverty indicators; 6 have unemployment indicators; and 8 sites have age indicators in the proposed cities. Table 2 summarizes the indicators for the various communities. Although most communities are in nonattainment air basins for ozone, PM 10 and PM 2.5, not all have EJ indicators. Nearly one-third have no EJ indicators. Appendix A overviews the proposed projects by city. The EJ indicators on a proposed project and city basis are also included in Appendix A. To give further detail, Appendix B contains demographic data of the cities selected for the proposed sites.

Table 2: Proposed Sites With EJ Indicators

	28 Sites	Percent of All Proposed Sites
No EJ Indicators	8	28.57%
One EJ Indicator	14	50.00%
Two EJ Indicators	1	3.57%
Three EJ Indicators	4	14.29%
Four EJ Indicators	1	3.57%
		100 % Total

Source: Energy Commission staff analysis

CHAPTER 4:
Summary

If approved, the proposed projects will result in 28 new sites for hydrogen refueling, in addition to a mobile refueler. The new hydrogen refueling sites will increase the use of hydrogen fuel cell vehicles. As more hydrogen fuel cell vehicles enter the market and begin to displace gasoline and diesel vehicles, tailpipe pollutants will decrease significantly.

The new hydrogen facilities stand to nominally increase traffic for the projects that involve hydrogen delivery by truck. Yet, a net benefit is realized from less petroleum use and more alternative fuel use as a result of these proposed projects. The anticipated impacts to the cities where these projects will be located are positive in terms of cleaner air and anticipated greenhouse gas reductions. There will be a reduction of known harmful emissions when an FCEV refuels at these stations as it will replace gasoline vehicles.

Of the 28 cities where projects are proposed, 8 have no EJ indicators, 14 have one EJ indicator, 1 has two indicators, 4 have three indicators, and 1 has four EJ indicators. The anticipated net benefit from these projects, regardless of the number EJ indicators, for the people who inhabit these cities is highly likely, if not certain, to be positive.

CHAPTER 5:
Acronyms

Air Quality Improvement Program (AQIP)
Air Resources Board (ARB)
Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)
California Energy Commission (Energy Commission)
California Environmental Quality Act (CEQA)
Carbon monoxide (CO)
Environmental justice (EJ)
Environmental Justice Screening Method (EJSM)
Fuel cell electric vehicle (FCV)
Localized health impact (LHI)
Nitrogen oxide (NO_x)
New Source Review (NSR)
Particulate matter (PM)
Program Opportunity Notice (PON)
Reactive organic gas (ROG)
Sulfur oxide (SO_x)
United States Department of Transportation (U.S. DOT)
United States Environmental Protection Agency (U.S. EPA)

APPENDIX A:
Proposed Project/City and EJ Indicators

Table A-1: Cities With Proposed Projects Having EJ Indicators

Proposed Project/ City	Minority	Poverty Level	Unemployment Rate	Age
Air Liquide Industrial US LP Palo Alto, CA				X
First Element Fuel, Inc. Campbell, CA				
First Element Fuel, Inc. Hayward, CA	X			
First Element Fuel, Inc. Mill Valley, CA				X
First Element Fuel, Inc. Redwood City, CA	X			
First Element Fuel, Inc. San Jose, CA	X			
First Element Fuel, Inc. Saratoga, CA				X
First Element Fuel, Inc. South San Francisco, CA	X			
First Element Fuel, Inc. Truckee, CA				
First Element Fuel, Inc. Coalinga, CA	X	X	X	
First Element Fuel, Inc. Costa Mesa, CA				
First Element Fuel, Inc. La Canada Flintridge, CA				X
First Element Fuel, Inc. Laguna Niguel, CA				
First Element Fuel, Inc. Lake Forest, CA				
First Element Fuel, Inc. Long Beach, CA	X	X	X	

Proposed Project/ City	Minority	Poverty Level	Unemployment Rate	Age
First Element Fuel, Inc. Los Angeles, CA (Culver City)				X
First Element Fuel, Inc. Los Angeles, CA (West Hollywood)				X
First Element Fuel, Inc. San Diego, CA		X		
First Element Fuel, Inc. Santa Barbara, CA	X			
First Element Fuel, Inc. South Pasadena, CA				
HTEC Woodside, CA				X
HyGen Industries, LLC Orange, CA	X			
HyGen Industries, LLC Pacific Palisades, CA	X	X	X	
HyGen Industries, LLC Rohnert Park, CA				
ITM Power Inc. Riverside, CA	X	X	X	
Linde LLC San Ramon, CA				
Linde LLC Oakland, CA		X	X	
Ontario CNG Station – StratosFuels Ontario, CA	X	X	X	X

Source: Energy Commission staff analysis

APPENDIX B:
Demographic Data

Table B-1: Demographic Data for Cities With EJ Indicators (percent)

City	Persons Below Poverty Level (2008-2012)	Black person (2010)	American Indian and Alaska Native (2010)	Persons of Hispanic or Latino Origin (2010)	White persons (2010)	Persons under 5 years of age (2010)	Persons over 65 years of age (2010)	Unemployment rate (April 2014)
GTI Mobile Hydrogen Refueling	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Air Liquide Industrial US LP Palo Alto, CA	4.9	1.9	0.2	6.2	60.6	5.4	17.1	2.8
First Element Fuel, Inc. Campbell, CA	6.7	2.9	0.7	18.4	58.1	6.6	11.2	4.5
First Element Fuel, Inc. Hayward, CA	13.5	11.9	1.0	40.7	18.8	7.5	10.2	6.4
First Element Fuel, Inc. Mill Valley, CA	2.4	0.8	0.2	4.5	85.5	5.9	18.9	2.9
First Element Fuel, Inc. Redwood City, CA	9.1	2.4	0.7	38.8	44.0	7.5	10.6	4.2
First Element Fuel, Inc. San Jose, CA	11.7	3.2	0.9	33.2	28.7	7.3	10.1	5.9
First Element Fuel, Inc. Saratoga, CA	3.4	0.3	0.1	3.5	51.6	3.3	20.3	2.6
First Element Fuel, Inc. South San Francisco, CA	7.0	2.6	0.6	34.0	22.0	6.2	13.1	5.2

City	Persons Below Poverty Level (2008-2012)	Black person (2010)	American Indian and Alaska Native (2010)	Persons of Hispanic or Latino Origin (2010)	White persons (2010)	Persons under 5 years of age (2010)	Persons over 65 years of age (2010)	Unemployment rate (April 2014)
First Element Fuel, Inc. Truckee, CA	9.8	.4	0.6	18.6	77.7	6.6	7.8	5.4
First Element Fuel, Inc. Coalinga, CA	23.6	4.1	1.3	53.5	37.7	8.0	7.9	13.2
First Element Fuel, Inc. Costa Mesa, CA	14.1	1.5	0.6	35.8	51.8	6.5	9.2	4.5
First Element Fuel, Inc. La Canada Flintridge, CA	2.1	0.5	0.1	6.3	64.7	3.7	15.7	2.9
First Element Fuel, Inc. Laguna Niguel, CA	5.6	1.2	0.3	13.9	72.5	5.1	13.0	3.9
First Element Fuel, Inc. Lake Forest, CA	5.0	1.7	0.5	24.6	57.2	6.3	9.2	3.4
First Element Fuel, Inc. Long Beach, CA	20.2	13.5	0.7	40.8	29.4	7.0	9.3	8.4
First Element Fuel, Inc. Los Angeles, CA (Culver City)	7.1	9.5	0.5	23.2	48.0	5.3	14.9	5.2
First Element Fuel, Inc. Los Angeles, CA (West Hollywood)	15.0	3.2	0.3	10.5	77.9	1.9	14.9	6.4
First Element Fuel, Inc. San Diego, CA	15.4	6.7	0.6	28.8	45.1	6.2	10.7	6.0
First Element Fuel, Inc. Santa Barbara, CA	14.7	1.6	1.0	38.0	54.8	5.5	14.2	3.8
First Element Fuel, Inc. South Pasadena, CA	7.6	3.0	0.4	18.6	43.6	5.2	12.1	3.7

City	Persons Below Poverty Level (2008-2012)	Black person (2010)	American Indian and Alaska Native (2010)	Persons of Hispanic or Latino Origin (2010)	White persons (2010)	Persons under 5 years of age (2010)	Persons over 65 years of age (2010)	Unemployment rate (April 2014)
HTEC Woodside, CA	4.1	0.4	0.1	4.6	86.1	4.2	20.2	4.2
HyGen Industries, LLC Orange, CA	10.7	1.6	0.7	38.1	67.1	6.4	10.7	4.6
HyGen Industries, LLC Pacific Palisades, CA	21.2	9.6	0.7	48.5	28.7	6.6	10.5	8.5
HyGen Industries, LLC Rohnert Park, CA	12.8	1.9	1.0	22.1	76.1	5.6	9.3	5.2
ITM Power Inc. Riverside, CA	17.5	7.0	1.1	49.0	34.0	7.2	8.6	8.4
Linde LLC Oakland, CA	20.3	28.0	0.8	25.4	25.9	6.7	11.1	8.9
Linde LLC San Ramon, CA	3.5	2.8	0.3	8.7	48.5	7.9	7.8	2.5
Ontario CNG Station – StratosFuels Ontario, CA	16.4	6.4	1.0	69.0	18.2	8.4	6.7	8.9

Sources: Unemployment information from the State of California, Employee Development Department (EDD) Labor Market Information Division: http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=133 and Age / ethnicity demographics, U.S. Department of Census: http://quickfacts.census.gov.

APPENDIX C:
Emissions Data

Table C-1: Truck Delivery Frequency (per day)[5]

Truck Delivery Frequency	2015	2016	2017	2018
GTI Mobile Hydrogen Refueling	Not applicable	Not applicable	Not applicable	Not applicable
Air Liquide Industrial US LP Palo Alto, CA	.24/day	.49/day	.83/day	.83/day
First Element Fuel, Inc. Campbell, CA	.83/day	.83/day	1.39/day	1.83/day
First Element Fuel, Inc. Hayward	.17/day	.17/day	.28/day	.39/day
First Element Fuel, Inc. Mill Valley, CA	.17/day	.17/day	.28/day	.39/day
First Element Fuel, Inc. Redwood City, CA	.50/day	.50/day	.89/day	.58/day
First Element Fuel, Inc. San Jose, CA	0/day	0/day	.05/day	.05/day
First Element Fuel, Inc. Saratoga, CA	.55/day	.55/day	.94/day	.64/day
First Element Fuel, Inc. South San Francisco, CA	.28/day	.28/day	.50/day	.67/day
First Element Fuel, Inc. Truckee, CA	.05/day	.05/day	.05/day	.05/day
First Element Fuel, Inc. Coalinga, CA	.05/day	.05/day	.05/day	.05/day
First Element Fuel, Inc. Costa Mesa, CA	.17/day	.17/day	.33/day	.39/day
First Element Fuel, Inc. La Canada Flintridge, CA	.17/day	.17/day	.33/day	.44/day
First Element Fuel, Inc. Laguna Niguel, CA	.28/day	.28/day	.90/day	.67/day
First Element Fuel, Inc. Lake Forest, CA	.28/day	.28/day	.90/day	.67/day
First Element Fuel, Inc. Long Beach, CA	.22/day	.22/day	.39/day	.50/day
First Element Fuel, Inc. Los Angeles, CA (Culver City)	.50/day	.50/day	.83/day	.56/day

5 Stations with electrolyzers have no truck delivery.

Truck Delivery Frequency	2015	2016	2017	2018
First Element Fuel, Inc. Los Angeles, CA (West Hollywood)	.55/day	.55/day	.89/day	.58/day
First Element Fuel, Inc. San Diego, CA	.33/day	.33/day	.55/day	.78/day
First Element Fuel, Inc. Santa Barbara, CA	.17/day	.17/day	.22/day	.33/day
First Element Fuel, Inc. South Pasadena, CA	.80/day	.80/day	.72/day	.94/day
HTEC Woodside, CA	0/day	0/day	.26/day	.42/day
HyGen Industries, LLC Orange, CA	0/day	0/day	0/day	0/day
HyGen Industries, LLC Pacific Palisades, CA	0/day	0/day	0/day	0/day
HyGen Industries, LLC Rohnert Park, CA	0/day	0/day	0/day	0/day
ITM Power Inc. Riverside, CA	N/A	0/day	.10/day	.33
Linde LLC Oakland, CA	N/A	N/A	N/A	N/A
Linde LLC San Ramon, CA	N/A	N/A	N/A	N/A
Ontario CNG Station – StratosFuels Ontario, CA	0/day	0/day	0/day	0/day
Total	**6.31/day**	**6.56/day**	**11.68/day**	**12.09/day**

Source: Energy Commission staff analysis

Table C-2: Criteria Pollutant Emissions from Delivery (per year)

Based on 50-Mile Truck Delivery (per day)

Criteria Pollutant	2015	2016	2017	2018
VOC (kg/year)	5.251	143.544	255.57	264.55
CO (kg/year)	18.645	509.648	907.422	939.28
NOx (kg/year)	91.493	2,500.83	4,452.69	4609.00
PM10 (kg/year)	21.291	581.958	1,036.17	1,072.54

Source: Energy Commission staff analysis

Emissions in Table C-2 were calculated using the following values for ultra-low-sulfur diesel.[6]

- VOC: 1.199 g/mile
- CO: 4.257 g/mile
- NO_x: 20.889 g/mile
- PM10: 4.861 g/mile

6 *Full Fuel Cycle Assessment: Well-to-Wheels Energy Inputs, Emissions, and Water Impacts*, CEC-600-2007-004-REV.